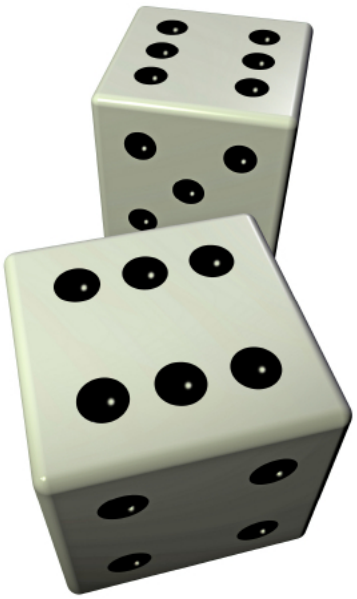
Bank Regulatory Capital: Why We Need It



Very simply: to **limit risk and reduce our potential, *unexpected* losses.**

Unlike normal companies, banks are in the business of issuing loans to individuals and businesses – which means that if those individuals and businesses default on their loans, **the bank loses money**.

Think about what happens in accounting terms if an asset – loans in this case – goes down: something on the liabilities & shareholders' equity side of the balance sheet must go down to match it.

In the best case scenario, this will be the bank's **shareholders' equity**: it acts as a buffer to cover losses on assets.

But if the bank "runs out" of shareholders' equity, something else will have to decrease – **deposits or other funding sources**. And that means you, the customer, will lose your deposits at that bank.

And that's why regulatory capital requirements exist: **so that a bank can absorb sufficient losses through its shareholders' equity rather than through customer deposits or other funding sources**.

Bank Regulatory Capital: Why It Affects Our Models & Valuation

With a normal company, metrics and ratios are almost an afterthought: you throw them in to make your model look nice, but leaving them out is not the end of the world.

With banks, by contrast, everything in the model is intricately linked to **regulatory capital requirements**:

- You can't blindly assume that revenue or assets are growing at a certain rate – they **can only grow in relation to how much "buffer" capital you have on-hand**.
- You can't just assume a payout ratio for dividends or assume any number you want for stock repurchases – you need to check how much capital you have first, and then decide how much can go to dividends or share repurchases.
- The required capital has an impact on valuation, because higher requirements mean fewer dividends.

So you can't just brush off regulatory capital as a "nice-to-have" topic – **you need to know it like the back of your hand if you want to model banks**.

There are 2 key concepts: **risk-weighted assets** and **tiers of capital**.

Risk-Weighted Assets

Not all assets are equally risky – cash in an ATM is probably safer than a subprime mortgage.

So when we think about regulatory capital, we need to **set requirements in relation to the riskiness of assets rather than just the assets by themselves**.

The Basel I Accord in 1988 defined risk weights for different types of assets on a bank's balance sheet.

You **multiply** these risk weights by the asset value and then add everything together to get a bank's total risk-weighted assets.

Basel I Risk Weights

Risk Weight	Example Assets
0%	Cash / government securities
10%	Certain public debt
20%	Interbank loans
50%	Residential mortgages
100%	Private sector debt

In addition, you also need to include **off-balance sheet assets** such as forwards and futures, options, and credit default swaps in this calculation; that's to prevent banks from acquiring tons of off-balance sheet assets and claiming that there's no risk at all.

Basel II Risk Weights

Risk Weight	Example Assets
0%	Cash and equivalents
35%	Residential mortgages
75%	Credit / auto loans
100%	Commercial real estate
100%	Other assets
By rating	Government securities
By rating	Interbank loans
By rating	Corporate loans

Basel I had some problems – for example, not all corporate debt should have 100% risk, but should instead depend on the company's credit rating – so Basel II was born in 2004.

The main difference was a **more complex risk weighting scheme** – many types of loans now depend on the entity's credit rating rather than a simple percentage.

I've listed the risk weights here for your reference, but realize that **in investment banking you don't actually make these calculations yourself**.

Banks never even disclose all their assets by risk weight – instead, they just give you a lump-sum "risk-weighted assets" number which you project.

So that's the first part of regulatory capital – different assets have different risks associated with them, and you calculate **risk-weighted assets** by multiplying these weights by individual assets and adding everything up.

You use **risk-weighted assets (RWA)** as the denominator when calculating **capital ratios** (keep reading).

Tiers of Capital

Just like all assets are not equally risky, not all capital is equally capable of protecting you – there are tiers:

- **Tier 1 Common Capital:** Common Shareholders' Equity – Goodwill – Non-MSR Intangibles
- **Tier 1 Capital:** Total Shareholders' Equity – Goodwill – Non-MSR Intangibles + Qualifying Hybrid Securities and Noncontrolling Interests
- **Tier 2 Capital:** Subordinated Debt + Non-Qualifying Hybrid Securities + Qualifying Allowance for Loan Losses
- **Total Capital:** Tier 1 Capital + Tier 2 Capital

Tier 1 Common is the strictest because you're saying, "In the event of a catastrophe, **all** we have available to absorb loan losses is our common equity, minus goodwill and intangibles."

But you do have other options – for example, Preferred Stock, Convertible Bonds, and Noncontrolling Interests could all absorb losses. And moving further down, so could Subordinated Debt and the Allowance for Loan Losses (since those don't represent **actual** losses yet).

Commercial Bank - Balance Sheet	
Assets:	**Balance**
Cash:	$ 200
Interbank Loans (AAA):	100
Residential Mortgages:	500
Credit Card Loans:	200
Corporate Loans (AAA):	500
Corporate Loans (BB-):	100
Allowance for Loan Losses:	(50)
Net Loans:	**1,250**
Goodwill:	50
Other Assets:	50
Total Assets:	**$ 1,650**
Liabilities & SE:	
Liabilities:	
Deposits:	$ 1,000
Senior Debt:	200
Subordinated Debt:	50
Borrowings:	150
Convertibles:	25
Total Liabilities:	**$ 1,425**
Preferred Stock:	25
Common Stockholders' Equity:	**200**
Total Liabilities & SE:	**$ 1,650**

In the balance sheet to the left, here's what the various tiers of capital would be:

- **Tier 1 Common Capital:** $150
- **Tier 1 Capital:** $175
- **Tier 2 Capital:** $125
- **Total Capital:** $300

And here are the calculations themselves:

- **Tier 1 Common Capital** = Common Equity – Goodwill = $200 – $50 = $150
- **Tier 1 Capital** = Common Equity + Preferred – Goodwill = $200 + $25 – $50 = $175
- **Tier 2 Capital** = – (Allowance for Loan Losses) + Subordinated Debt + Convertibles = $50 + $50 + $25 = $125
- **Total Capital** = Tier 1 Capital + Tier 2 Capital = $175 + $125 = $300

Now that we have these numbers, we can get into calculating the **capital ratios**.

Capital Ratios

We've now calculated that the average **Risk-Weighted Assets (RWA)** number for this fictional company is $1500 – or maybe they've given us that number in their filings. So now we can look at **tiers of capital in relation to risk-weighted assets**.

When you play poker, betting $50 means something different when you're up $1,000 vs. when you're up $100, and it's the same here: **we're measuring risk relative to how much capital we have backing up our bets**.

- **Tier 1 Common Ratio:** Tier 1 Common / Average RWA
- **Tier 1 Ratio**: Tier 1 Capital / Average RWA
- **Tier 2 Ratio:** Tier 2 Capital / Average RWA
- **Total Capital Ratio:** Total Capital / Average RWA
- **Leverage Ratio:** Tier 1 Capital / Average Tangible Assets

- **Tier 1 Common Ratio** = $150 / $1500 = 10.0%
- **Tier 1 Ratio** = $175 / $1500 = 11.7%
- **Tier 2 Ratio** = $125 / $1500 = 8.3%
- **Total Capital Ratio** = $300 / $1500 = 20.0%
- **Leverage Ratio** = $175 / $1600 = 10.9%

These numbers matter because the Basel accords set out **specific requirements** for banks **(NOTE: These numbers are changing under Basel III – keep reading).**

- The **Tier 1 Ratio** must be greater than or equal to **4%** at all times;
- The **Tier 1 Common Ratio** must be greater than or equal to **2%** at all times;
- The **Total Capital Ratio** must be greater than or equal to **8%** at all times;
- **Tier 2 Capital** cannot exceed **Tier 1 Capital**;
- The **Leverage Ratio** must be greater than or equal to **3%** at all times (US Only)

Strength	Total Capital Ratio	Tier 1 Ratio	Leverage Ratio	Tangible Equity Ratio
Well capitalized	>= 10% and	>= 6% and	>= 5%	
Adequately capitalized	>= 8% and	>= 4% and	>= 4%	
Undercapitalized	>= 6% and	>= 3% and	>= 3%	
Significantly undercapitalized	< 6% or	< 3% or	< 3% and	> 2%
Critically undercapitalized				<= 2%

If you fall below "Adequately Capitalized" then you're in trouble: that means **higher deposit insurance premiums**, **restrictions on dividends, acquisitions, and share repurchases**, and possibly even **government takeover** if it gets bad enough.

In practice, 99% of banks are "well capitalized" and most large commercial banks like JP Morgan maintain capital ratios far above the requirements – Tier 1 Capital, for example, is often closer to 10%.

How Basel III Is Changing the Rules for Regulatory Capital

In 2010, the Basel Committee met to propose **new standards** for regulatory capital – how it's defined, what counts toward Tier 1 Capital and Tier 2 Capital, and so on. These new standards will be phased in between 2013 and 2018-2019. I haven't listed them throughout this quick reference because they're not yet in full effect.

Here's how the **regulatory requirements** differ between Basel II and Basel III:

Ratio or Requirement	Basel II Requires…	Basel III Requires…
Tier 1 Ratio	4%	6%
Tier 1 Common Ratio	2%	4.5%
Total Capital Ratio	8%	8%
Tier 2 Capital Cannot Exceed Tier 1 Capital	Yes	Yes
Leverage Ratio	3% (US Only)	3% (All)
Conservation Buffer	N/A	2.5%
Countercyclical Buffer	N/A	2.5%
Liquidity Coverage Ratio	N/A	Enough liquid assets to cover net cash outflows over 30 days
Net Stable Funding Ratio	N/A	Stable funding must exceed what's required over 1-year extended stress period

You always **add** the "Conservation Buffer" to the ratios above it, so effectively all the ratios are 2.5% higher than what's listed there; you add the "Countercyclical Buffer" if credit is expanding rapidly in the general economy, to prevent against downside risk.

So potentially, the required Tier 1 Common Ratio could be as high as **9.5%** – much more conservative than Basel II, where technically the only requirement was being above **2%**.

In addition to these new rules and required ratios, the definitions of **Tier 1 Capital** and **Tier 2 Capital** have changed slightly and **Tier 3 Capital** (which we didn't even go into in this course) has been eliminated completely:

- **Tier 1 Capital:** Recognition of Noncontrolling Interests, MSRs, Equity Investments, and DTAs will be more limited; in other words, you may have to deduct portions of these from the Tier 1 Capital calculation (exact rules TBD). Most Tier 1 Common must now be comprised of Common Shares & APIC and Retained Earnings.
- **Tier 2 Capital:** There will no longer by "Upper" and "Lower" Tier 2 Capital, and some instruments may no longer qualify as Tier 2 Capital.

In addition to all of that, Basel III is also defining new risk weights for many types of assets; these new risk weights are not yet available (or at least I could not find a reliable source that listed them), but be aware that the RWAs for many banks will change as a result.

How do all these new rules affect the models in this course and your own models?

The same concepts will still apply, but some of the calculations may differ slightly now; when in doubt, go with what a bank does in its most recent filings.

The course contents are still 100% applicable even after these changes because we targeted relatively conservative capital ratios to begin with. We may eventually revise the course to include Basel III rules from the start, but that's unlikely to happen until it's phased in completely.

Will Basel III prevent the next financial crisis? Don't hold your breath.

Yes, it's more conservative than Basel II… but it's still based on **risk-weighting** and so companies can always manipulate those numbers and find loopholes. And it doesn't address **systemic risk** in any way.

How to Use These Capital Requirements in Your Models

We can't get into all the details in this guide, but here's an example of how you might apply these rules:

- You have calculated everything in your model except for dividends. The bank has RWA of $1,000.
- For a normal company, at this point, you might just assume a payout ratio and use that to calculate dividends.
- For a bank, you would **calculate Tier 1 Capital with all the changes and additions from that year *except* for dividends**.
- You find that the bank has $130 of Tier 1 Capital with all the changes and additions, before dividends.
- The bank is targeting a 12% Tier 1 Ratio, so it needs to maintain Tier 1 Capital of $120 at all times.
- Therefore, the bank can only issue $10 worth of dividends that year – issuing anything beyond that would reduce Shareholders' Equity, therefore reducing its Tier 1 ratio to below 12%.

Nuances and Footnotes

The definitions above for the **tiers of capital** are generic, but every bank calculates its capital ratios differently; you can't just make your own calculations and assume they're correct.

Instead, you need to go off what they do in their filings and follow those in future years.

Project items if they change (Shareholders' Equity and Allowance for Credit Losses, for example), or hold them constant if you don't know what they refer to or how they'll change in the future (Fair Value DVA in the calculation to the right).

This is an example from JP Morgan's filings. **Do not obsess over all these details – go with what they have, and project where necessary.**

Especially as Basel III gets implemented, there's no telling what will change, or which banks and regions will follow everything precisely vs. which will only enforce some (or none) of the rules.

Risk-based capital components and assets

December 31, (in millions)	2009	2008
Tier 1 capital		
Tier 1 common capital:		
Total stockholders' equity	**$ 165,365**	$ 166,884
Less: Preferred stock	**8,152**	31,939
Common stockholders' equity	**157,213**	134,945
Effect of certain items in accumulated other comprehensive income/(loss) excluded from Tier 1 common equity	**75**	5,084
Less: Goodwill[a]	**46,630**	46,417
Fair value DVA on derivative and structured note liabilities related to the Firm's credit quality	**912**	2,358
Investments in certain subsidiaries	**802**	679
Other intangible assets	**3,660**	3,667
Tier 1 common capital	**105,284**	86,908
Preferred stock	**8,152**	31,939
Qualifying hybrid securities and noncontrolling interests[b]	**19,535**	17,257
Total Tier 1 capital	**132,971**	136,104
Tier 2 capital		
Long-term debt and other instruments qualifying as Tier 2 capital	**28,977**	31,659
Qualifying allowance for credit losses	**15,296**	17,187
Adjustment for investments in certain subsidiaries and other	**(171)**	(230)
Total Tier 2 capital	**44,102**	48,616
Total qualifying capital	**$ 177,073**	$ 184,720
Risk-weighted assets[c]	**$ 1,198,006**	$ 1,244,659
Total adjusted average assets[d]	**$ 1,933,767**	$ 1,966,895

So your best bet is to always **follow a company's filings and management guidance**. The rules and specific numbers may change over time, but the concepts outlined here will not.